

**In the Claims**

Applicant has submitted a new complete claim set below.

Please cancel claims 1-22 and 33-53 without prejudice.

- 1-22. (Canceled).
23. (Original) A method of forming a gradient comprising:  
passing a first fluid through a first channel;  
passing a second fluid through a second channel;  
joining the first fluid and the second fluid in a common channel;  
passing fluid from the common channel into at least three additional channels; and  
recombining the fluid from the three additional channels into a single channel under  
conditions of substantially laminar flow to produce a composite fluid.
24. (Original) The method of 23 wherein the fluid is a liquid.
25. (Original) The method of claim 23 wherein the fluid is a gas.
26. (Original) The method of claim 23 further comprising passing at least the first fluid  
through additional channels in additional stages.
27. (Original) The method of claim 23 further comprising the step of dividing the  
recombined fluid into four additional channels.
28. (Original) The method of claim 23 further comprising passing a third fluid through a  
third channel and joining the third fluid with the first and second fluids in the common channel.
29. (Original) The method of claim 23 further comprising the step of adjusting the rate of  
flow of at least the first fluid.

30. (Original) The method of claim 23 further comprising the step of smoothing the gradient profile in the recombined fluid.

31. (Original) The method of claim 30 further comprising the step of allowing substantial diffusion to occur between laminarly flowing streams in the recombined fluid.

32. (Original) The method of claim 31 further comprising the step of altering the amount of diffusion by altering the velocity of the flow of at least the first fluid.

33-53. (Canceled).

54. (Original) A method of treating a surface comprising:

passing a fluid along a portion of a surface under conditions of substantially laminar flow wherein the fluid comprises a concentration gradient of at least one substance, the concentration gradient being substantially perpendicular to the direction of flow and being substantially continuous across the fluid; and

treating differentially a plurality of sections of the portion of the surface exposed to different concentrations of the substance.

55. (Original) The method of claim 54 wherein the portion of the surface is less than 10 cm wide.

56. (Original) The method of claim 55 wherein the portion of the surface is less than 1 cm wide.

57. (Original) The method of claim 56 wherein the portion of the surface is less than 1 mm wide.

58. (Original) The method of claim 54 wherein the substance is a catalyst.

59. (Original) The method of claim 54 wherein the treatment comprises hardening the surface.
60. (Original) The method of claim 54 wherein the treating comprises depositing the substance on the surface.
61. (Original) The method of claim 60 wherein the portion of the surface is less than 1 cm in width.
62. (Original) The method of claim 54 wherein the treating comprises forming a topological gradient on the surface.
63. (Original) The method of claim 62 wherein the treating comprises removing material from the surface.
64. (Original) The method of claim 63 wherein the portion of the surface is less than 1 cm in width.
65. (Original) A method of diluting a fluid comprising:  
feeding a high concentration fluid to a first inlet;  
feeding a low concentration fluid to a second inlet;  
passing the fluid from the first inlet and the fluid from the second inlet into a first generation common channel;  
splitting the fluid in the common channel into at least three second generation channels;  
recombining the fluids from the at least three second generation channels into a second generation common channel;  
splitting the fluid in the second generation common channel into a plurality of third generation channels; and  
collecting fluid from at least one of the plurality of third generation channels.

66. (Original) A method of producing a fluid exhibiting two different concentration gradient profiles, the method comprising:

combining at least a first starting fluid with a second starting fluid to form a combined stream, the first starting fluid comprising a first substance that is substantially absent from the second fluid;

dividing the combined stream into a series of second stage streams; and

joining at least two of the second stage streams to form a composite stream wherein the composite stream exhibits a different concentration gradient profile for the first substance and a second substance.

67. (Original) A method of producing a series of solutions comprising:

contacting a concentrated solution of a substance and a less concentrated solution of the substance to form a combined fluid; and

separating the combined fluid, without using a membrane, into a plurality of separate streams wherein at least one of the separate streams comprises the substance at a concentration that is substantially different than the concentration of the substance in another of the separate streams.

68. (Original) The method of claim 67 wherein the concentration of the substance in one of the separate streams is about equal to the concentration of the substance in either the concentrated solution or the less concentrated solution.

69. (Original) The method of claim 67 further comprising the step of contacting a third solution comprising a second substance with the combined fluid.

70. (Original) The method of claim 69 wherein at least one of the separate streams contains concentrations of the first substance and the second substance at a ratio that is different than the ratio of the first substance and the second substance in at least one other of the separate streams.